

Full Length Research Paper

A survey of indigenous herbal diarrhoeal remedies of O.R. Tambo district, Eastern Cape Province, South Africa

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Accepted 30 December, 2009

Indigenous health system and the use of herbal plants have been recognized as pivotal in primary health care and a system to reckon with in achieving one of the targets of the millennial goals on health. An ethnobotanical survey was conducted to identify indigenous herbal remedies for diarrhoea and associated stomach ailments in rural areas of the O.R. Tambo district municipality in the Eastern Cape province of South Africa. The main objective of the study was to gather ethnomedical data on potentially valuable indigenous medicinal plants for the eventual development of new pharmaceuticals and also emphasize the role of ethnomedicine in primary health care. The use of herbal remedies in the treatment of diarrhoea and dysentery was investigated using interviews. The survey was conducted among traditional healers and knowledgeable local elders who use medicinal plants to treat common illnesses. Data from the survey indicated the names of plants commonly used in the treatment of diarrhoea and associated ailments, the methods of preparation, parts used and administration. A total of 32 plant species belonging to 26 families were reportedly used as diarrhoea remedy in the study area. The most predominant families of medicinal plants employed and most frequently recommended were Fabaceae (16.67%), followed by Hyacinthaceae and Hydnoraceae (8.33% each). The most commonly utilized portions of plants for medicinal purposes included roots and leaves. Other parts were corms, bulbs, tubers, fruits and bark. The methods of preparation often employed were decoctions and infusions whilst medication was frequently administered orally or as enema. Some of the plants were used singly or mixed with other plant(s) while some edible ones are consumed as food. The survey documented a diversity of plants employed as remedy for diarrhoea. Integration of this form of health care system into western medicine is warranted. The propagation of such medicinal plants is vital for sustainable use of these medicinal plants.

Key words: Ethnobotany, herbal remedy, indigenous, diarrhoea, primary health.

INTRODUCTION

According to the World Health Organization (WHO, 1978), traditional medicine has been described as one of the surest means to achieve total health care coverage of the world's population, yet this form of health care system has long been relegated to a marginal place. Recently, WHO commitment to the Millennium declaration has been reaffirmed by its governing bodies (WHO, 2002a,

2002b) and Ministers of Health of the WHO African Region (2007) have also made a declaration to recognize the role of traditional medicine in primary health care.

In the rural and remote parts of most African countries, hospitals and clinics are often sparsely located far away from dwellers and where there is accessibility to clinics, other factors such as finance and mobility make orthodox medicine far fetched from these people. It has been estimated that up to 80% of the world's rural populations depend on plants for their primary health care, since western pharmaceuticals are often expensive, inaccessible

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Figure 1. Map of O.R. Tambo District Municipality. Source: http://isrdp.dplg.gov.za/documents/IDP/ISRDP/OR_Tambo_IDP.pdf.

or unsuitable (Cunningham, 1993; WHO, 1978). Considering the relative ratios of traditional practitioners and university-trained doctors in relation to the whole population in African countries, traditional healers and remedies made from plants play an important role in the health of millions of people. The people are reliant on traditional healers who usually reside among them trusting their ingenuity on the use of herbs and some other cultural and traditional beliefs. These facts thus provide a role for traditional healers among the rural dwellers' trust.

It is becoming increasingly urgent to document the medicinal use of African plants because of the rapid loss of the natural habitat for some of these plants due to anthropogenic activities. The migration factor especially among the youths to urban areas as well as the demise of most of the local practitioners along with their wealth of knowledge are sources of threat to the future of most of the important cultures including knowledge on the use of plant species (Akerle et al., 1991; Bodeker, 1994; Schlage et al., 1999).

Several studies have been conducted in the Eastern Cape to identify and document biodiversity and ethnomedicinal value of the province (Dold and Cocks, 2001; Kambizi and Afolayan, 2008; Mucina and Rutherford, 2006; Van Wyk and Smith, 2001). Nevertheless, exploration of the plant biodiversity of the province is in-

exhaustive due to the vastness of the vegetation hence the survey of O.R. Tambo district municipality (ORTDM). This paper presents findings of a survey of the indigenous herbal diarrhoeal remedies in the O.R. Tambo District of the Eastern Cape, South Africa. The main objective of the study was to gather and document ethnomedical data on potentially valuable indigenous medicinal plants for the eventual development of new pharmaceuticals and also emphasize the role of ethnomedicine in primary health care.

A brief description of O.R. Tambo district municipality

O.R. Tambo district municipality (ORTDM) is located in the east of the Eastern Cape Province along the Indian Ocean coastline of South Africa. It is situated in the former Transkei homeland area of the province which falls within the latitudes $30^{\circ} 00'$ and $34^{\circ} 15'$ South and longitudes $22^{\circ} 45'$ and $30^{\circ} 15'$ East. ORTDM is bordered by the Alfred Nzo district to the North, Ukhahlamba district to the Northwest, Chris Hani to the West and Amathole district to the Southwest (Figure 1). It is more than 2,700 m above sea level and descends southward from the great interior plateau to form a relatively narrow coastal plain along the Indian Ocean (<http://isrdp.dplg>.

gov.za/documents/IDP/ISRDP/OR_Tambo_IDP.pdf).

The population of the district municipality stands at 1.7 million persons and covers an area of 16,617 square km². A total of 93% of the district municipality's population reside in rural areas while an estimated 77% of the population is unemployed (STATSSA, 2001). The mother-tongue of the majority of the dwellers is *isiXhosa*, an Nguni language while the rest of the people speak Afrikaans and English.

The region is predominantly rural with large tracts of arable land. Nevertheless, agriculture in ORTDM is inadequately developed and largely subsistence. Traditionally, Eastern Cape is known for rearing livestock which represents 70% of the province's gross agricultural income. ([http://www.britannica.com/EBchecked /topic/176933/Eastern-Cape](http://www.britannica.com/EBchecked/topic/176933/Eastern-Cape)).

This study area includes moderate and high rainfall areas. ORTDM has a diversity of vegetation, from grasslands and thicket to forests and bushveld including coastal and marine habitats. The district is considered to have the richest natural resources and the most fertile areas in the country, with good soils and climatic condition (http://isrdp.dplg.gov.za/documents/IDP/ISRDP/OR_Tambo_IDP.pdf). The vegetation of the study region has been previously described (Cawe et al., 1994; Clark et al., 2008; Mucina and Rutherford, 2006; Van Wyk and Smith, 2001).

However, due to the rich flora of this study area coupled with the disappearing traditional knowledge on medicinally useful plants, a lot of grounds still needs to be covered in the documentation of the indigenous knowledge on medicinal plants. Thus, it is critical to preserve the plants and knowledge of their uses.

Diarrhoeal diseases are often associated with low living standards, poor sanitation infrastructure and poor access to potable water sources. The predominantly rural Eastern Cape Province (ECP) is noted for lack of proper sanitation and piped or clean water (ECDOH, 2009). Hence, water-borne diseases are not far-fetched from ORTDM with its predominant rural dwellers depending largely on spring, pond or river water which are often shared with domestic animals. According to a previous study in South Africa (Obi et al., 2007), incidence of diarrhoea could be linked to poor quality of household drinking water. A recent Eastern Cape Department of Health statistics (2009) confirmed a significant number of deaths due to diarrhoea among children, with the highest number of deaths reported in the ORTDM. Of grave health consequences is cholera which recently ravaged Zimbabwe and rapidly spread into South Africa. Kwa-Zulu Natal (KZN) Province of South Africa was designated as endemic for cholera (Henninger and Snell, 2002). ORTDM shares border with KZN and as indicted in Figure 2, it is worth noting that the blue arrow indicating direction of spread of cholera is towards ORTDM. A recent outbreak of cholera in South Africa between November 2008 and April 2009 claimed 65 lives whilst there was >12, 000

case definitions of the disease (Archer et al., 2009). With the high incidence of HIV/AIDS and multidrug resistant TB in South Africa (Cohen, 2006; Jones et al., 2008), diarrhoea can pose a serious challenge to the public health in terms of burden of diseases.

MATERIALS AND METHODS

An ethnobotanical survey on medicinal plants employed in the treatment of diarrhoea and associated ailments was conducted within ORTDM. Areas visited included Port St. Johns, Lusikisiki, Flagstaff, Tabankulu, Bizana, Ugie and Coffee bay from June 2008 to February 2009. The investigation was carried out using interviews among traditional healers and knowledgeable local elders who use medicinal plants to treat common illnesses. Questionnaires were administered through personal contact discussions. This method proved to be a very viable and an effective option of data collection. The choice to employ this particular method was heavily influenced by the literacy levels, remote locations visited and willingness of the respondents that participated in this survey. The traditional healers consulted were trained practitioners of repute within the various communities. The survey was to elicit information on the names of plants commonly used in the treatment of diarrhoea and associated ailments, the methods of preparation, parts used and administration. Interviews were conducted in *isiXhosa*, the local language of the informants and were later translated to English. In most cases the interviews often started in the form of informal discussions to gain the confidence of the interviewees.

With the assistance of the local practitioners, samples of the plant material used as diarrhoeal remedy were collected from the wild. Scientific identification of samples was aided by staff of the herbarium of Walter Sisulu University, where voucher specimens were deposited. Further characterization of plants and their usage was established by consultation of literatures and monographs (Hutchings et al., 1996; Pooley, 1993, 1998). For data analysis, plant species were grouped into their respective families along with local and common names. An inventory of plant species was compiled from this fieldwork.

RESULTS

Ethnobotanical information obtained from the study area on medicinal plants used in the treatment of diarrhoea revealed 33 medicinal plants scattered in 26 families. Table 1 shows the diverse families of the various indigenous medicinal plants. Among the families, Fabaceae provided the highest proportion of medicinal plants prescribed at 16.67% followed by Hyacinthaceae and Hydnoraceae, 8.33% each.

About 30 visits were conducted involving 15 traditional healers and knowledgeable elders with more than one visit per interviewee in most cases. The rationale behind the use of some of the medicinal plants listed according to the traditional healers was that the information about the plants were revealed to them by their ancestors in their dreams or knowledge about the plants was passed onto them by parents or experienced mentors. Most traditional healers claimed never to use cultivated plants but depended on sourcing from the wild. The usage and preparation as described by the interviewees are shown

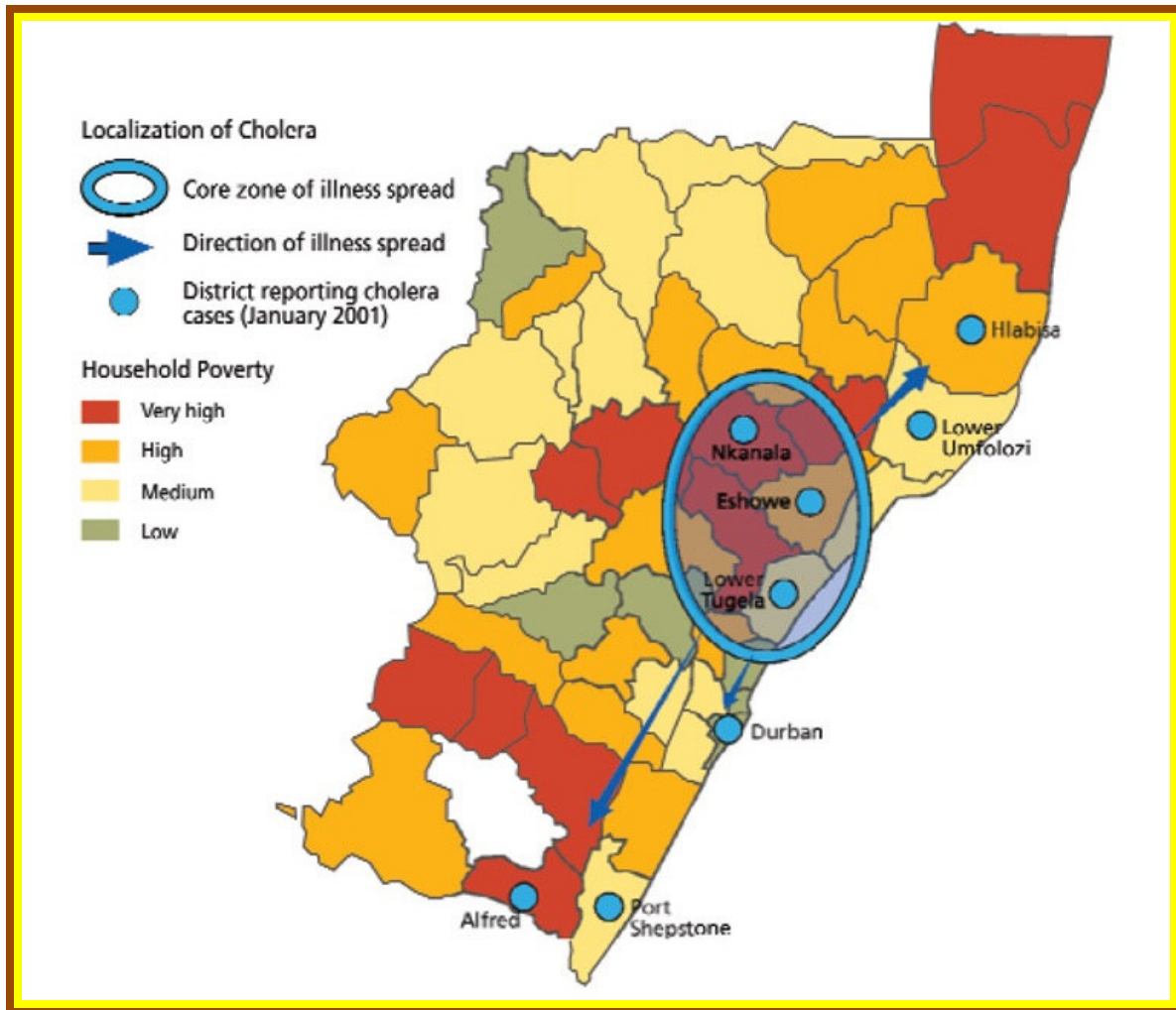


Figure 2. WHO cholera endemic zone. Source: www.who.int/entity/heli/tools/en/gridmap2.jpg; Henninger and Snell (2002).

on Table 1.

The frequently utilized portions of plants for medicinal purposes included roots, corms, leaves and bark but roots were the mostly used preparation of medicine for the treatment of diarrhoea, followed by the use of leaves. The methods of preparation varied considerably from one healer to the other. Plant remedies were often utilized in the form of decoctions and infusions. Extraction may be hot by boiling in water or mere soaking plant parts in cold water. Plant parts may be eaten raw in some cases whilst medication is frequently administered orally or as enema. Some of these plants were used singly or mixed with other plant(s) or even with western mixtures such as salt, vinegar and in a particular instance Amsphogel (Aluminum hydroxide) was mixed with plant part by the traditional healer. The survey also revealed that dosage of plant extracts was not consistent. The analysis revealed the diversity of indigenous plants used as diarrhoeal remedy in OR Tambo. These medicinal plants which are of value

in the treatment of diarrhoea are also used to treat different other ailments while some edible ones are consumed as food.

DISCUSSION

Traditional medicine is the most widely used medical system in the rural setting of ORTDM. Orthodox medicine is costly and often inaccessible. Not only is ethno-medicine popular and acceptable due to their important role in primary health-care delivery systems, but also, in many areas, it has been the only system available. Likewise, medicinal plants need more attention because it forms an essential component of the total well-being of humans particularly the rural dwellers whose major sources of food, shelter, energy and medicines are forest plants (Akerlele, 1988; Hamayun et al., 2003). Furthermore, the emerging global problem of multidrug resistant pathogens (Alekhshun and Levy, 2007; Bisi-Johnson et al.,

Table 1. Herbal remedies used for the treatment of diarrhoea and associated ailments.

FAMILY/SCIENTIFIC NAMES COMMON NAME	LOCAL NAMES	PLANT PART	USAGE & PREPARATION	OTHER USAGE
ALLIACEAE <i>Tulbaghia alliacea</i> L.f. Wild Garlic	Umwelela (X) ivimba- mpunzi (X) Sikwa (Z)	Bulb	Stomach ailments, bulb infusion taken orally to treat fever.	Remedy for tuberculosis (TB) and influenza, as an antihypertensive or to expel intestinal worms (W & B-B, 1962). As a medicated bath to treat paralysis, rheumatism and reduce fever temperature (W & B-B, 1962).
AMARANTHACEAE <i>Hermbstaedtia odorata</i> Wild Cockscomb Rooi-aarbossie	Ubuphuphu (X,Z)	Leaves	Leaves eaten as food and infusion for diarrhoea.	Root cleansing stomach wash alone or with <i>Acaccia xanthophloea</i> and <i>Cappa</i> (Hutchings et al., 1996).
AMARYLLIDACEAE <i>Scadoxus puniceus</i> (= <i>Hemanthus magnificus</i> , <i>H. natalensis</i>) Bloody Lily, Snake Lily	Umpompho -wezinja, Isiphompo, umgola (Z)	Bulb & roots	Stomach ailments, diarrhoea, nausea.	Bulb poisonous, use for poultices (Batten & Bokelmann, 1966). Coughs (Bryant, 1966), headaches, poisoning antidote (Hutchings et al., 1996).
ANACARDIACEAE <i>Protorhus longifolia</i> (Bernh. ex C. Krauss) Engl. Red Beech	Izintlwa, ikubalo, umkupati (X)	Bark	Bark dried powdered and guava and Qangazani boiled & taken orally for diarrhoea and bloody stool.	Heart burn and stomach bleeding (Hutchings et al., 1996).
APOCYNACEAE <i>Acokanthera oppositifolia</i> (Lam.) Codd= <i>A. venenata</i> Common Poison-bush	inHlungunye mbe Intlungunye be (X, Z)	Leaves	Leaf decoction for stomach ache, diarrhoea, antihelmintic	Treat snakebite (Gerstner, 1939). Spider bite, aches, intestinal worms, cold (Pooley, 1993). Powder from dried roots as snuff for headache (Bhat & Jacobs, 1995).
ASCLEPIADACEAE <i>Xysmalobium undulatum</i> (L.) W.T.Aiton Milkwort, Uzura	Ishongwe (X,Z), Itsongwe	Roots	Boil root for diarrhoea, stomach ailments or pain.	Dysentery, Headaches (Pujol, 1990). Flower and seed decoction for colic, poison antidote (W & B-B, 1962)
ASPHODELACEAE <i>Aloe candelabrum</i> Berger. Candelabrum Aloe <i>Bulbine abyssinica</i> , Bushy Bulbine,	Ikhalana Inkalane (X) Uphondonde (Z) Utswelana Intelezi (X) Ibhucu (Z), Incelwane (X);	Leaves Leaves, tubers	Leaf decoction for diarrhoea. Boil leaves for vomiting, diarrhoea, TB.	Treat bilharzias, dysentery, cracked lips, skin ailments, urinary complaints, rheumatism, as a charm (Pooley, 1998). Tuber decoctions-antispasmodic to quell vomiting (Hutchings et al., 1996).
ASTERACEAE <i>Bidens bipinnata</i> Spanish-black jack, Spanish needle	Uvelemampo ndweni uvelegoli	Leaves	Leaves edible, infusion for diarrhoea.	Rheumatism (W & B-B, 1962). Hemorrhage, reduce cancer, flu, cold, fever (Pooley, 1998).
CORNACEAE <i>Curtisia dentata</i> (Burm.f.) C.A.Sm.= <i>C. faginea</i> Assegai	Umlaheni (X,Z), Unsirayi (X), Umgxina, Umlaheni (Sefile), Uzintlwa	Bark, Root	Diarrhoea, stomach ailments.	Stomach ailments including diarrhoea, blood strengthener, aphrodisiac (Pajol, 1990).

Table 1. Contd.

EUPHORBIACEAE <i>Euphorbia cooperi</i> N.E.Br. ex. Berger Euphorbia or Milkweed, Spurge, Transvaal Candelabra Tree	Umhlonhlo (X)	Bark of root	Bark of root ground dry boiled, then mix with a sachet epsom salt, cool & add 2 spoons vinegar for diarrhoea, stomach disorders. For infants, mix equal portion of decoction with Amsphojel to flavour milk.	
FABACEAE subfamily MIMOSACEAE <i>Acacia mearnsii</i> De Wild Blackwood, Black Wattle	Ublekwana (X) Udywabasi (X, Z) Indywabasi	Bark	Bark infusion taken orally for diarrhoea, dysentery	Sore throat, coughs, children fever, tooth ache (Hutchings et al., 1996).
FABACEAE (LEGUMINOSAE) <i>Elephantorrhiza elephantina</i> (Burch.) Skeels Elephant's Root	Intolwane (X,Z)	Root, stem	Boil equal part plant and <i>Acokanthera oblongifolia</i> for diarrhoea, stomach ailment. Infusion of ground stem alone for diarrhoea and menstrual disorder.	Syphilis, stop bleeding (Jacot Guillardmod, 1971), chest complaints, heart conditions (W & B-B, 1962). Fever, ulcers, dysentery, diarrhoea, dysmenorrhoea (Bryant, 1966).
GERANIACEAE <i>Pelargonium sidoides</i> Rose-scented Pelargonium	Umsongelo (X)	Leaves, roots	Infusion of leaves or root enema for diarrhoea, dysentery and vomiting.	Bruised leaves soothes skin rashes, in tea to treat kidney & bladder ailments, nausea, gonorrhoea, root decoction severe diarrhoea in Transkei (Hutchings et al., 1996).
<i>P. luridum</i> Wild geranium	Umsongelo, ishwaqa	Leaves	Eaten raw as vegetable, treat dysentery, nausea, vomiting, fever	Leaf paste for wound, powdered root mixed with food for dysentery (W & B-B, 1962).
HYACINTHACEAE <i>Eucomis autumnalis</i> (Mill.) Chitt. Common Pineapple Flower	Ubuhlungu becanti Isithithibala (X) Umathinga (Z)	Bulb	Boil bulb for abdominal problems.	Decoctions of bulb and roots for coli, flatulence (Cunningham, 1993). Syphilis (W & B-B, 1962). Treat urinary & pulmonary ailments, fever (Hutchings et al., 1996; Roberts, 1990).
<i>Scilla nervosa</i> (Burch.) Jessop White Scilla	Umagaqana, magaqana (X), Imbizankulu ingema (Z)	Bulb	All purpose herb. For diarrhoea, TB, various diseases, cleans blood.	Purgative, sprain, fracture, cancers (W & B-B, 1962). Rheumatic fever, dysentery (Rood, 1994; Silayo et al. 1999).
<i>Scilla</i> sp.	Umasixabane (X)	Root	Infusion of ground tuber and <i>H. africana</i> and <i>Curtisia dentate</i> for diarrhoea	
HYDNORACEAE <i>Hydnora africana</i> Warty Jackal Food, Jakkalskos Kanip	Ubuklunga (X) Umavumbuka(Z), Umafumbuka (X)	Fruits, tuber, leaves	Boil handful of ground dried tubers and blackwood and peach for diarrhea	Parasitic on <i>Euphorbia</i> roots. Fruit pulp like potato eaten by people birds jackal, plant dried ground raw for dysentery, amenorrhoea. Swollen glands or inflamed throat (W & B-B, 1962).

Table 1. Contd.

HYPOXIDACEAE <i>Hypoxis latifolia</i> Hook. African potato (Eng.) Small Yellow star-flower <i>H. hemerocallidea</i> = <i>H. rooperi</i> Star-flower	Inongwe llabateka (X) Inongwe llabateka (X)	Tuber	Boil ground dried tuber for diarrhoea.	Treat benign prostrate (van Staden, 1981). Headaches, dizziness, mental disorders, inflammation, HIV (Singh, 1999; van Wyk, 2000).
IRIDACEAE <i>Gladiolus sericeo-villosus</i> Hook.f. <i>forma sericeo-villosus</i> Natal Lily, parrot's beak <i>gladiolus</i>	Umnunge (X)	Corm	Corm's decoction for cold and dysentery, TB (use with care)	Corms for dysentery oral and enema ((Hutchings et al., 1996). Impotence (W & B-B, 1962). Menstrual pain (Bryant, 1966).
MESEMBRYANTHEMACEAE E <i>Carprobatus edulis</i> Hottentot's fig, ghaukum, rankvy	Ikhambi-lamabulawo, umgongozi, Igcuthuma Unomatyumtyum, igcukuma	Leaves	Various diseases, diarrhoea	Allergies, diabetes, sore throats (Hutchings et al., 1996). Juice from pounded leaves as gargle for sore throats, thrush, diphtheria, treat digestive troubles, diarrhea & dysentery (W & B-B, 1962).
MYRTACEAE <i>Psidium guajava</i> L. Guava	Ugwawa (X,Z)	Leaves	Leaves boiled for alone or mixed with other plants for diarrhea.	Infusion of leaves for bloody diarrhea (Hutchings et al., 1996). Roots for venereal disease by Vhavenda (Mabogo, 1990 The Ethnobotany of the Vhavenda. Unpublished Master of Science Thesis, University of Pretoria).
OLEACEAE <i>Olea europaea</i> subsp. <i>Africana</i> Wild Olive	Uzintlwa (X)	Fruit	Infusion for diarrhoea and bloody Stool	Leaves for urinary and bladder infections (Roberts, 1983; Pooley, 1993). Immature fruits as astringents against diarrhea (Iwu, 1993).
POLYGONACEAE <i>Rumex obtusifolius</i> Dock	Idololenkonyane (X,Z)	Leaves	Leaf extract for diarrhea	Infertility in women (W & B-B, 1962). Leaf decoction for worms (W & B-B, 1962). Scabies, powdered root as gargle for laryngitis
ROSACEAE <i>Prunus africana</i> (Hook.f.) Kalkman Red Stinkwood, Bitter Almond, Peach	Umkhakhazi (X), Umkakase (X)	Roots	Root of peach and bark of blackwood and leaves of guava and roots of umswaning for diarrhoea, abdominal ailments.	The bark extracts have become popular in Europe for the treatment of benign prostate hypertrophy (Van Wyk et al. 1997)
RUBIACEAE <i>Pentanisia prunelloides</i> (Klotzsch ex Eckl. & Zeyh) Walp Broad-leaved Pentanisia RUBICEAE Pavetta – Bride's Bush <i>Psychotria capensis</i> (Eckl.) Vatke Black Bird-berry	Icishamilo, Icimamilo (X,Z) Isithitibala (Z), UmGono-gono (X)	Roots, leaves, bulb Fruits	Boil grated dried bulb, a spoon taken orally to stop vomiting, diarrhoea in children. For adult, a wine shot 3 times daily. Expose face to steam from boiling herb fro pimples. Rub leaves to soothe swollen body. For diarrhoea and vomiting.	A range of ailments, root as enema for stomach pain (Hutchings et al., 1996). Hemorrhoids, snakebite, rheumatism (Bryant, 1966; Gerstner, 1941). Unspecified part for tuberculosis (Batten & Bokelmann, 1966). Leave paste for wound. For gastric complaints and root infusions are taken to cause vomiting (Hutchings et al., 1996).

Table 1. Contd.

SAPINDACEAE Atalaya – Krantz Ashes <i>Hippobromus pauciflorus</i> (L.f.) Radlk. False Horsewood	Ulwathile (X)	Bark, root, leaves	Diarrhoea, dysentery	Coughs, catarrh related headaches (Bryant, 1966). Eye problems (W & B-B, 1962).
SCOPHULARIACEAE <i>Physalis peruviana</i> Cape gooseberry	Igquzu (X)	Leaves	Leaf edible, stomach disorders.	Leaf infusion as enema to relieve abdominal ailment in children (W & B-B, 1962). Treat high blood pressure, diabetes (W & B-B, 1962).
SOLANACEAE <i>Solanum aculeastrum</i> Dun Apple of Sodom, poison apple, Goat apple	Umthuma (X,Z)	Fruits, roots, leaves.	Fruit decoction orally for haemorrhoids & dysentery, fruit as enema for diarrhoea.	Fruit pulp as enema. Rheumatism, ringworm in cattle (Pooley, 1993). Root & leaves for coughs, fever, sore throats, colic, indigestion, abdominal pain, venereal diseases (W & B-B, 1962; Kokwaro, 1976).
VERBENACEAE <i>Clerodendrum glabrum</i> E.mey = <i>C. rehmannii</i> Cat's Whiskers or Verbena Tree or Tinderwood	Umqangazani Uqangazana (X), iNunkisiqaqa(X) Umqangazane	Leaves	Bloody stool, chest infections.	Snakebite (Roberts, 1990). Leaf infusion for intestinal parasites (W & B-B, 1962). Leaf and root of <i>Cymbopogon marginata</i> (Steud.) for roundworms, threadworms, cough, fevers (Hutchings et al., 1996).

KEY: X = Xhosa; Z = Zulu; W & B-B = Watt and Breyer-Brandwijk (1962).

2005; Levy, 2005; Obi et al., 2007) and the need for the discovery of lasting and sustainable therapy to combat diseases such as HIV/AIDs, malaria and cancer which have defied available treatments has led to a paradigm shift to natural herbal product for succor.

This study documented a diverse list of plants used as remedy for diarrhoea in ORTDM. Previous reports have also linked some of the plants encountered in the course of this survey with remedy of diarrhoea, dysentery or stomach ailments (Bigalke, 1967; Hutchings, 1989; Van Wyk and Gericke, 2000; Van Wyk and Wink, 2004; Watt and Breyer-Brandwijk, 1962). The parts of the plants commonly used were roots and leaves. The problem of inconsistent dosaging is a critical set back which is crucial in the standardization of medicinal plants. Another factor which may impact on the traditional therapy standardization is the work place hygiene and the quality of water used in preparation particularly with cold extraction. Most of the traditional healers boast of treating some ailments that have defied modern medical practice. While some of the healers embrace the idea of both western medicine and traditional medicine complementing each other, a few others do not. Some of the traditional healers tend to hide the information on plants used for different ailments largely for fear of losing patronage to the investigators or interested persons. By way of mystifying the native trade, the vast majority of plants are collected from the wild and cultivation of the plants is often not encouraged by the traditional healers. Some participants believed that cultivated plants would

have been attacked by evil spirit and hence will not be potent for use. This is similar to the findings of Keirungi and Fabricius (2005). Scientific evaluations of the therapeutic claims as well as toxicological data are still underprovided for many of the plant species. This study forms the basis for microbiological and phytochemical research on selected diarrhoeal medicinal plants and work is in progress.

In the course of this study, some unsustainable methods of harvesting of medicinal plants were observed. For instance, root excavation and bark striping of plants which pose a threat to the continued existence of plants were used to harvest plants such as *Pelargonium sidoides* and *Acacia* spp. These two methods have been reported as most harmful harvesting methods for plants (Akerle et al., 1991; Cunningham et al., 2002). The tendency for extinction of scavenged species is obviously going by the unsustainable handling and the habit of not cultivating medicinally valuable species. For conservation to be effected, planting of designated valuable herbal plants in small gardens in the homesteads is strongly recommended. Also, large scale farming of commercially viable plants should be encouraged whilst scientists are implored to undertake studies on various factors affecting growth of plants such as soil conditions, temperature and seasonal variations and disseminate best propagation methods. Conclusively, it is pertinent for scientists to urgently salvage this cheap and alternative health care system from extinction, help preserve indigenous knowledge and conserve nature.

ACKNOWLEDGEMENTS

The authors wish to appreciate all those who assisted during the survey particularly in the translation of local plant names and communications with traditional healers: Prof Lamla (Anthropology Department, WSU), Mr David Wopula, Ms Thuli Jaca and Natasha. The assistance of Dr Immelman and Mrs Cloete in plant identification is highly appreciated. We also acknowledge the warm reception of the rural dwellers and most especially the traditional healers who willingly parted with their indigenous knowledge.

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